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IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF OKLAHOMA

STATE OF OKLAHOMA, ex rel, W.A. DREW EDMONDSON, in his capacity as ATTORNEY GENERAL OF THE STATE OF OKLAHOMA, et al.

Plaintiffs,

V. ) No. 05-CV-329-GKF-SAJ

TYSON FOODS, INC., et al.,

Defendants.

REPORTER'S TRANSCRIPT OF PROCEEDINGS
FEBRUARY 22, 2008
PRELIMINARY INJUNCTION HEARING
VOLUME IV

BEFORE THE HONORABLE GREGORY K. FRIZZELL, Judge

APPEARANCES:

For the Plaintiffs: Mr. Drew Edmondson
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EXHIBIT
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is, Mr. Churchill?
A. I'm a professional engineer in the Province of Ontario.
Q. Who do you work for?
A. I work for Conestoga-Rovers & Associates.
Q. And what type of company is Conestoga-Rovers & Associates?
A. We're an environmental engineering firm, multidisciplinary firm with a focus on environmental work.
Q. Mr. Churchill, what has been admitted as Defendants' Exhibit 289, I've placed before you. Is that a true and accurate copy of your expert report that was attached as Exhibit 44 to the joint response of the defendants?
A. Yes, sir.
Q. Would you describe briefly for the Court, Mr. Churchill, your work history and qualifications that relate to the opinions expressed in your report?
A. I have a bachelor of science degree in engineering. I'm a professional engineer in Ontario. I've over 20 years experience in the environmental field. Part of that experience includes the collection of many, many environmental samples, including soil, groundwater, surface water, sludge, wipe samples, air samples.
Q. Have you had experience, sir, in developing field sampling programs?
A. Yes, sir. I've followed agency approved work plans which contain a sampling analysis plan. I've prepared sampling

01024

analysis plans myself, educated personnel that work with me and for me on execution of those plans.

Q. All right. Attached to Defendants' Exhibit 289 is Appendix A. Is this a correct and up-to-date version of your curriculum vitae?

A. Yes, sir.

Q. All right. Now, part of the services you render or Conestoga-Rovers renders to clients is environmental field sampling?

A. Correct.

Q. And does Conestoga-Rovers provide these services on an international basis?

A. Yes, sir.

Q. Are you familiar with sampling standards and industry practices within the United States?

A. Yes, the primary location of my work is in the United States.

Q. Are you familiar with working under protocols established by the United States Environmental Protection Agency?

A. Yes, sir, absolutely. Most of our work plans that prepare are prepared to follow U.S. EPA and industry standards.

Q. And you were hired to work for the defendants in this case; is that right?

A. Correct.

Q. And what were -- what were you hired to do?

01025

A. We were hired to review a work plan and standard operating procedures prepared by CDM and then to conduct field oversight of CDM's sampling activities.

Q. Now, as far as the oversight, I note your report is entitled Report of Sampling Oversight Operations, Illinois River Watershed, Oklahoma and Arkansas; is that right?

A. Yes, sir.

Q. Now, the field sampling that Conestoga-Rovers observed or monitored, was that the sampling that was done pursuant to the subpoenas issued from this Court, if you know?

A. Yes, it's my understanding that it was at least a portion of the sampling done pursuant to the subpoena.

Q. Do you understand that Camp Dresser McKee did other sampling for which Conestoga-Rovers did not receive notice nor did it monitor the work?

A. That's my understanding, yes.

Q. Can you tell the Court how you went about performing your task of monitoring or observing CDM's sampling?

A. Sure. Typically we set up one or two teams of personnel. Those teams might consist of three or four individuals, one person taking field notes, another person taking a video log, a third person recording still photographs and another person collecting, recording the geospatial information on GPS. Sometimes there might be a little bit of overlap between those personnel.

01026

Q. What were the media or substances that were sampled at the time your teams were making observations?

A. Soil, spring water, groundwater and poultry litter.

Q. All right. What you refer to groundwater, were those samples taken from groundwater wells?

A. Yes, sir.

Q. The reason I ask is there's been evidence in this case that there has been some groundwater sampling by geoprobe. You didn't observe geoprobe sampling, did you?

A. No, sir.

Q. Now, when you were actually on site with the CDM sampling team, explain what your team did as far as making its observations.

A. We watched CDM's field activities very, very closely. And having reviewed the standard operating procedures, we kept a close eye to see if and how they were following their standard operating procedures and other common industry accepted procedures.

Q. You, sir, were personally present for some of this sampling?

A. Yes, sir, I was personally present on eight farms.

Q. Did you review documentation from the other Conestoga-Rovers teams that were present during sampling when you were not?

A. Yes, sir.

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Q. What kind of documentation was that?
A. Video footage, photographs and portions of field logbooks.
Q. All right. I have placed before you what has been admitted as Defendants' Exhibit PI 50. Would you please tell the Court what Exhibit 50 is?
A. This is a photograph that was collected by -- taken by Conestoga-Rovers.
Q. Would you open the packet of materials that I gave you or unclip them for your use?
MR. MCDANIEL: May I approach the witness, Your Honor?
THE COURT: You may, sir.
Q. (By Mr. McDaniel) Go ahead and unclip them. Mr. Churchill, Exhibit 50 is the entire group of photographs that were taken. Would you tell the Court where those photographs came from?
A. This photograph was taken by Conestoga-Rovers & Associates. What we were trying to show in this particular one was --
Q. Well, just a moment. I'm just asking you is this a group of photos that you collected. I don't really want to talk about the specifics of that photo.
A. Yes, sir.
Q. Okay. In total, about how many photographs did Conestoga-Rovers take during this monitoring program?
A. It was in the order of 1,800.

01028

Q. So this grouping in Exhibit 50, is this just a subset you selected for purposes of your report in this hearing?

A. Yes, sir.

Q. Now, were you asked as part of your task to determine whether the plaintiffs' field sampling was done in conformance with the Plaintiffs' own standard operating procedures and industry standards?

A. Yes, sir.

Q. Did you review Camp Dresser & McKee's standard operating procedures?

A. Yes, sir.

Q. Can you tell the Court briefly and generally what are standard operating procedures?

A. Standard operating procedures are a set of procedures that are established to, one, allow you consistent methods of collecting samples, regardless of the type of media, whether it be soil, water, surface water, et cetera, that will lead to ultimately to good sample integrity and then finally reliable sample results.

Q. Now, if standard operating procedures are not adhered to, what are the potential results?

A. Unreliable data ultimately.

Q. Did you find that Plaintiffs' sampling team failed to adhere to standard operating procedures or industry practice?

A. Yes, sir, very frequently.

01031

it's a good thing I gave you an eight and a half by eleven because I can barely read it from here.

THE COURT: Yes, sir.

Q. (By Mr. McDaniel) Tell us, Mr. Churchill, what is Defendants' Demonstrative 36.

A. This is a table that's -- this table is a summary table of the key issues which were identified in Table 1, presented in a slightly different format. We've identified as broken up in the left column from top to bottom based on the soil samples, spring water samples, groundwater samples and the litter samples collected. Across the top from left to right we've identified, based on the numbers from Table 1, the number of fields that we believe the data is compromised in and then broken up further to the number of farms on a percentage basis.

Q. All right. You're organize -- you organized the document a little differently for the water and litter samples. Can you explain that, please?

A. Right. The soil samples -- it's broken out like that for the soil samples because of compositing, et cetera, between the various fields and farms. For the water samples, the spring water, groundwater and the litter samples, those were collected at individual locations.

Q. All right. Working through these summary observations, can you describe generally for the Court, Mr. Churchill, what Conestoga-Rovers' observations were with regard to the soil

01032

sampling conducted by Camp Dresser & McKee?

A. Sure. The soil sampling was quite different from what we're normally used to doing ourselves and what we're used to observing in the industry. It was quite remarkable some of the differences that we have observed as compared to commonly accepted protocols and CDM's own work plans. Some of the key things that we observed were -- one of the first things that we observed that was that there was cow manure present in a significant number of the fields. It's my understanding that the focus of this is poultry litter and not cow manure.

We saw sample probe, sampling equipment placed in sample bags. Failure to decontaminate sampling equipment between sample locations and fields and also farms. Failure to change sampling gloves, I mean, it's just -- it was extremely obvious.

THE COURT: What is the standard operating procedure and/or industry accepted practice with respect to soil samples obtained on the same field when those samples are mixed? Does one have to clean the probe between every sample if you're going to mix the substance that you receive on that particular field?

THE WITNESS: Absolutely. It was in the work plan, CDM's plan, in their work plan and their intent to collect discrete soil samples from each of three depth intervals. The first one being zero to two inch below grade, two inch to four

inch, and four inch to six inch. So in that context, when you're actually trying to collect, you know, discrete samples, it's absolutely important to decontaminate equipment.

THE COURT: But perhaps you didn't hear my question. When you are going to mix those soil samples, is it absolutely necessary to clean the probe?

THE WITNESS: Yes, it is.

THE COURT: The difficulty I'm having is whenever I do a soil test on my Bermuda lawn, they tell me to go down, what, an inch, gather a certain amount, go to another place in the lawn, go down an inch, gather it and then mix that up and they tell you how much they want. It doesn't strike me as a rational standard operating procedure if you are going to mix the soil, that you would have to clean the spoon that I use before I go to pick up the soil that I'm about to mix with that which I've already gotten. What sense does that make?

THE WITNESS: I'd like to give an example. If you were able to -- if you picked up something on the soil core probe, they advanced a steel probe at least six inches into the ground. If you are able to pick up something on the probe, be it cow manure or anything --

THE COURT: That's another issue, that's a separate issue from this. You're saying that because of the possibility that one can pick up something on the probe external to the soil that you're trying to retrieve at depth, that you have to

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clean off the probe even if you're sampling from the same field and going to mix those soil samples?

THE WITNESS: Correct, because they've got samples from discrete intervals and they made no attempt to remove soil that was in contact with the inside of a probe. So what you're pulling from one location to the other ends up --

THE COURT: I see.

MR. MCDANIEL: Your Honor, I asked the technician to put up page number 4 from Exhibit 50, a photograph. Anyway, it's before you. I thought that might help Mr. Churchill be responsive to your questions.

THE COURT: Well, this became the subject matter of previous testimony. I don't know if you were here at the time, but that's why I asked.

Q. (By Mr. McDaniel) Mr. Churchill, the way the plaintiffs took these samples where they wanted to get a zero to two inch, two to four inch, and four to six inch sample, they were all taken from a single core; is that correct?

A. Yes, sir.

Q. How does that relate to the questions you were answering for His Honor regarding the need to decontaminate that probe?

A. Okay. Perhaps an explanation of how the samples were physically collected in the field might help here. What we have here is that CDM would advance a steel coring probe into the ground at least six inches and retrieve it from the ground.

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What we're looking at here is they're showing how -- they're pulling the sample material from the probe into a sample bag. Typically what they did is they would take a sample knife and remove material from below a six inches layer, okay. Then they would take the same sample knife and use it to remove material from the four inch to six inch depth and drag that into the sample bag. That's what we're looking at here. A couple of other things I'd like to point out here in a minute, but I want to explain the sample collection procedure.

Then they would take the bag -- as they're pulling the material into the sample bag from the four inch to six inch layer, they wouldn't get all of the material. So you would have a reasonable amount of material left in the probe from that four inch to six inch depth. Then they would take a new sample bag, calling that representative of the two inch to four inch depth interval, take the same sample knife and start pulling that material from two inch to four inch and dragging that down. They would insert the end of the probe into the sample bag and start dragging that down into the bag. So by doing that, they would be picking up residual soil that was still remaining in the probe from the four inch to six inch layer and pulling that in as well, okay. They would call that their two inch to four inch sample layer.

From there, they would take a new plastic bag and then attempt to sample the zero to two inch sample material.

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Meanwhile, there is still a residual material because they don't get it all out. There would be a residual material from the two inch to four inch layer still remaining in the probe. So then they go to sample the zero to two inch, take the knife, pull it down. As well as pulling material from the zero to two inch depth, it would also be pulling material from the -- sorry. As well as pulling material from the zero inch to the two inch depth, they would also be pulling material from the two inch to four inch depth interval as well into the bag, resulting in unrepresentative samples.

Q. At the end when those three, if you want to call them slices, are taken out of the device, then what did you typically observe about what was done with the sampling probe?

A. And in concluding this, they would lift the end of the probe and then empty all remaining soil that was remaining in the soil into the sample that was supposed to have been representative of the zero to two inch depth interval.

Q. Now, these three layers, two inch -- supposedly two inch layers in the sample, when CDM composited them for a field, did they take all of the zero to two inch samples, put them in a container, all the two to four inch samples and put them in a container and then the four and six and put them in a separate container?

A. We didn't observe the compositing, but that was my understanding that that's the way it was going to be taken out.

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Q. Was that the SOP?
A. Yes.
Q. So the Court asked the question regarding how if he wants to take some fertility sampling for lawn or his land, how does this sampling differ from what would be agricultural fertility sampling when it comes to the question of decontamination of equipment?
A. Well, this sample they're trying to show -- it's my understanding that they're trying to show or get reliable data from three discrete depth zones and you don't get that from taking a -- from using a probe or other sampling equipment that was not cleaned between. There was no attempt made during this to remove the residual soil that was in contact with the probe. And normally in an environmental sampling investigation, for sure you would be doing that.
Q. The fact that one of the questions at issue is bacteria, to what extent does that relate to the need to decontaminate between sample locations?
A. If you picked up some bacteria at one sample -- sorry. If that probe was in contact with manure from one sample node and then transported to the next node at a certain depth interval, it would cross-contaminate that sample.
Q. So rather than just have one sample that may have been contaminated by manure --
A. Exactly, it could continue on to the next one and the next

one there after that and the following one as well.
Q. All right. Let's look at Exhibit 50, page 6. I want to talk about some of the other issues you mentioned in your discussion of soil. You made several comments about cattle and manure. What are we seeing in Exhibit 50, page 6?
A. This photograph was taken primarily to show the presence of, you know, not just one or two cattle in one of these sampling areas, but the whole herd.
Q. Was it -- were the bulk of fields where these soil samples taken, were they being grazed?
A. Yes, sir.
Q. Your field notes reflected that cow manure was observed in at least 64 percent of the fields and on 79 percent of the farms?
A. Correct.
Q. All right. Let's look back at Photograph 50, page 4, the one we were just looking at. Are there other issues that are identified in your Table 1 and on your demonstrative exhibit that are depicted in this photograph you can point out for the Court?
A. Yes, there are several here. We see visible soiled sampling gloves or nitrile gloves being used. Those gloves were not typically changed between individual sample nodes, nor were they changed between sample fields resulting in whatever is on the gloves could have ended up in the soil samples.

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We've got other photographs where, I mean, gloves with -- soiled gloves were in contact with soil sample material. One of the SOPs indicated that all of the surficial organic material was supposed to be removed from the soil samples. We can see here some roots and things like that in the upper portion of the sample. We see the tip of the soil probe again in contact with the inside of the sample bag.

Q. What's the problem with the probe inside the bag?

A. Because whatever was on the sample probe on the outside is getting directly introduced into the sample material.

Q. Now, the question we spent a few moments on and that is the contamination of this sampling equipment, on what percentage of the fields and farms did you observe this failure to decontaminate the sample probe?

A. We reported that in about 84 percent of the farms.

Q. Is that when the CDM team went from one field to another; is that right?

A. Correct.

MR. PAGE: Objection, leading, Your Honor.

THE COURT: Sustained, rephrase.

MR. MCDANIEL: All right. Let me rephrase the question. I guess it was leading because of my voice inflection, right?

Q. (By Mr. McDaniel) Mr. Churchill, when the Camp Dresser & McKee sampling team went from one field to another field, did

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you document the percentage of fields and farms where you observed they did not decontaminate the soil sample probe?

A. Yes, sir, 40 percent.

Q. All right. That was for fields?

A. Yes.

Q. What was the number for farms?

A. Eighty-four percent of the farms.

Q. Now, the procedure we talked about a few moments ago where you expressed to the Court the need to decontaminate between sample nodes?

A. Yes.

Q. What percentage of the time did you observe that they did not decontaminate between sample nodes?

A. A hundred percent of the time.

Q. All right. Exhibit 50, page 2, please. Would you tell the Court why you selected this photograph?

A. Yes, I mentioned earlier as well as failure to decontaminate sampling equipment between nodes and fields, they also did not change their gloves between sample locations, and this is just a very, very basic requirement of environmental sampling to always change your gloves between samples. I showed in the earlier photograph, you could see a significant amount of dirt on the sampling gloves. This one here we also see some dirt and soiling on the gloves and that we see the gloves, you know, immediately inside of the sample bag in

contact with the bag. We also see some organic material in the sample as well.

Q. What was the standard operating procedure for removing vegetative material before the soil probe was advanced?

A. The standing -- the SOP was to take a shovel and remove the vegetation from the ground surface prior to advancing the probe.

Q. Did you ever observe the CDM sampling team following that procedural step?

A. No, we never observed that.

Q. Now, you made an observation on the demonstrative or it's noted on the demonstrative about how and what percentage of the fields and farms it was observed that the sampling team actually touched the sample. What were those percentages?

A. Seventy percent of the occasions for the field which compromised 100 percent of the locations on the farms.

Q. All right. Let's go to Exhibit 50, page 7, please, and tell the Court what is visible in this photograph.

A. Well, if I can shed a little bit of light here. In order to establish the depth intervals to be sampled, CDM used a ruler to measure off between the zero to two inch and two to four inch and four inch to six inch. This photograph was taken to show where, in fact, the ruler that is being used to make the measurements and which at times was in contact with the soil and the probe was lying in cow manure.

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Q. Let's look at Exhibit 50, page 15, please. Please tell the Court what is significant about this photograph.

A. There are a few things in the photograph here. It's not the industry standard, I've never seen it done to use cotton gloves in the collection of environmental soil samples. We've seen this on numerous occasions. Again, there was no decontamination of either the probe or the sample knife between individual sample nodes nor between fields. Here's an example of the type of soil that would be stuck to the sample knife. So while they were pulling material from a certain depth interval with this knife, once they collected that sample, the same knife with soil on it would be used to collect the upper sample. We also see the tip of the probe again inside the sample bag.

Q. If Conestoga-Rovers had been hired and the standard operating procedure called for a single core to be taken but then removing a zero to two, two to four and four to six samples, what type of device would you have used and how would you have used it?

A. We would have used a split spoon sampling device. A split spoon is similar to the probe in that it's manufactured steel, two and a half to three feet long. It's advanced. It's got coupling over the end. You drive the spoon into the ground, retrieve it, take off the caps and open it up fully. So you actually have a full kind of half circle of exposed sample

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material to sample from. We would have used -- our split spoons would have been decontaminated between every sample. No sampling equipment, every single knife or spoon would have been cleaned between not only each node, but between each depth interval. We always remove the outer layer of soil which is in contact with the split spoon. CDM made no attempt of that at all. And we always wear nitrile gloves, interchangeable gloves and you're using many, many, many sampling gloves, changing them between every sample and every layer.

Q. All right. The sampling probe being placed in the sample bag, what percentage of fields and farms was that observed?

A. A hundred percent of the field and a hundred percent of the farms.

Q. All right. Mr. Churchill, please look at Exhibit 50, page 9. Tell the Court why you selected that photograph.

A. This photograph was selected to show where CDM had advanced the soil core probe through a cow pattie.

Q. What's the little orange flag?

A. The orange flags were used -- CRA would have put that flag in after the fact in order to locate that. So when we used a GPS to get the coordinates of that sample location, it was a marker for us.

Q. Page 10 of Exhibit 50, please tell the Court what we see here.

A. This is another example of where the soil core probe was

advanced through cow manure.
Q. All right. Page 14 of Exhibit 50, please. Tell the Court what we're seeing there, Mr. Churchill.
A. CDM used a triangle. It was typically a yard stick taped at each corner to mark out where their sample locations were going to be from what we see here. So that same triangle was moved from node to node, from field to field during the collection of the samples. What we see here is another location, still again, where the probe was advanced directly through cow manure for the sample collection. And we have the sampling equipment, the triangle, also in contact with manure.
Q. So the brown area near the tip of the triangle, is that cow manure in your opinion?
A. Yes, sir, sure.
Q. Any question in your mind, Mr. Churchill, that that's cow manure?
A. No question at all.
Q. All right. At what percentage of fields and farms did you observe where the CDM sampling team actually penetrated a cow pattie with their soil probe?
A. We observed that in 16 percent of the fields and 53 percent of the farms.
Q. All right. Now, you made another observation on your chart about where cow manure was observed in close proximity to the sampling points. What percentage of fields and farms were

01045

compromised by the fact that cow manure was observed in close proximity to the sampling points?

A. We determined that 50 percent of the fields were compromised as a result of sampling in close proximity of the cow manure and 84 percent of the farms.

Q. All right. Let's look at Exhibit 50, page 19, please.

THE COURT: Just one second. With regard to the triangle, I'm not certain -- perhaps 14 shows contact of the triangle with the top of that cow pie. But in that the sample should be taken as you described, why is it important that the triangle not come in contact with or touch a cow pie? You're not sampling with the triangle.

THE WITNESS: Correct, but that triangle is getting transported, the same triangle without any decontamination or cleaning in between, and getting transported from sample node to sample node and then from field to field. So whatever is on the triangle could end up in your soil samples.

Q. (By Mr. McDaniel) Does the fact that the gloves were not being changed play any role in your opinion about the issue of failure to decontaminate the triangle?

A. Would you mind repeating the question?

Q. Sure. If a CDM employee picks up a contaminated piece of equipment like this triangle, what's the potential that that contamination could find its way into a soil sample other than your prior example?

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A. Sure. CDM, during the sample collection, at times they would rotate. So one person at one time might actually physically be collecting the soil sample and then a certain period of time or a number of sample locations later, that person be using the driver which was a handheld device used to advance the probe. They might be doing that or one of the other or they could be holding the sample bag over the end of the probe. So, you know, whatever could have been on the sample triangle or on the outside of the probe or on the driver here --

THE COURT: I get it.

Q. (By Mr. McDaniel) All right. Let's look at page -- Exhibit 50, page 19. Is this a driver that you referred to?

A. Yes.

Q. What's the significance of this photograph?

A. The driver has been placed in cow manure.

Q. All right. What percentage of fields and farms did you observe this error?

A. Twelve percent of the fields which affects 42 percent of the farms.

Q. And I don't want to shortcut the explanation, but I gather the Court understood why you were pointing that out from the prior discussion. Does that relate to the ability to get on the hands and then transfer it?

A. Exactly.

Q. Now, let's move to the spring sampling, Mr. Churchill. Would you give the Court a brief summary of the observations Conestoga-Rovers made with regard to Camp Dresser & McKee's taking of samples at springs?

A. Sure. We observed the collection of four spring water samples. I personally observed one of the most, I'll say glaring examples of inability or unwillingness to follow an SOP. It's referred to here on the CDM stepping in a spring prior to sampling it. The result of that -- I remember it actually very, very clearly. We had all walked down, both the CDM crew and CRA personnel walked down to locate what CDM believed was a spring. Walking down to that area, it was obviously an area where cattle had been present. There were cow patties on the path. I actually saw a footprint in one of the cow patties.

Shortly after that, CDM went to go sampling in one of these springs and one of the sampling personnel kind of slipped and stepped into the spring stirring up sediment. There was also a cow pattie about 18 inches, two feet from the actual spring, where they were sampling. The person retreated from that area, then walked around and then intentionally stepped in a spring prior to sampling, then inserted the sampler intake tube into the spring. The result of that is collecting sediments which have been likely degraded by cow manure in the sample. That was just one of the ones, it was a fairly glaring

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example that I had personally observed. The other springs, there was evidence of cattle at least in and around the spring.

Q. Did you observe -- this pumping device that was used to obtain the samples, does it have a discharge point?

A. Yes.

Q. Did you make any observations with regard to how that was deployed?

A. Yes, effectively they used a peristaltic pump which has an intake tube which was inserted into the spring. Then that tube goes through the pump to a discharge tube. And prior to collecting the sample, they were running spring water that was being extracted from the spring through the discharge tube, and it was discharging, you know, down the bank and back into the spring where they were sampling. And that was coming right down again through an area that we observed cow patties present on.

Q. Did you observe springs where the area that was sampled was some type of surface pool?

A. Yes.

Q. Did you observe surface pools that were sampled that had evidence of access or accessibility to livestock or wildlife?

A. Yes, absolutely for sure.

Q. Would you explain briefly your observations with regard to the groundwater well sampling monitored by Conestoga-Rovers?

A. Yes, we observed the collection of six groundwater

samples. Again, this was pretty significant variations or departures from standard operating procedures here. Normally when you go to collect a sample from this, you would allow the well to be purged for a certain period of time. The CDM work plan states that they're going to purge these for 15 minutes prior to sample collection. On one occasion we saw them go to -- it was at a dairy farm and there was a hose next to the barn and immediately grabbed that hose, had a spray nozzle on the end and immediately start collecting the sample directly from the nozzle, directly from the hose without any purging.

Q. Any other observations you want to share with the Court about the groundwater sampling that you observed?

A. Well, yes, sir. I mean, just along that same line at that same location, you would never collect a groundwater sample from a hose. You're introducing the possibility of contaminant from whatever was going to actually be -- whatever might be present in the hose or on the nozzle. I'd also just like to explain the reason why you purge a well before sampling is because you want to collect a sample that's representative of the groundwater in the formation, not what's sitting in the well and that could have been sitting there for some period of time. Okay.

Q. Did you observe any issues with regard to sterilizing the sampling point for a water well?

MR. PAGE: Objection, leading.

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THE COURT: Overruled.

A. I was going to get to that here. On the -- on one occasion, again, we saw them sampling from a spigot, sampling a well directly from the spigot. Normally you would take some kind of precaution to make sure that the spigot itself wasn't contributing to any, you know, contamination or bacteria in your samples. And you might do that by flaming the spigot or at least, you know, taking a bleach solution and making some effort to clean it.

Q. (By Mr. McDaniel) Were all the spigots that were sampled, were they outside as compared to an inside faucet?

A. Yes, they were outside.

Q. Let's move on to the last issue and that was the poultry litter sampling. Was all the sampling that you observed, was it actually conducted in poultry houses?

A. Yes, sir.

Q. Explain your observations with regard to that.

A. Okay. One of the first observations we made was that, you know, in keeping with good standards, you're supposed to be using clean sampling equipment. One of the first observations that we made was a fairly large manufacturer's label present on the spade that was used to collect the sample. No attempt was even -- let alone to clean the spade, no attempt was even made to remove the label. The spade was a tapered spade. So the top was square and as it came down towards the bottom, it

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tapered in. So using that type of a sampling device inherently resulted in collecting litter that was more representative of the upper portion of the pack because as they retrieved it, because of the taper on the spade, material from the lower portion would just fall off into the floor of the barn.

Q. All right, I'm trying to draw -- if this is a cross section and this is litter and this is the soil below.

A. Right.

Q. You're talking -- are you referring to taking a sample like that, sir, or --

A. Yes, sir. Actually, yes.

Q. Explain what, in your opinion, is the problem with that method.

A. Well, the idea of collecting the litter sample, they're supposed to get a sample that was representative of the entire column of litter. In fact, what we're seeing was mainly because of the taper of the spade as they pulled it up, a lot of material from the lower portion of the pack would fall off. The other thing that I should mention that actually shows up very well on that sketch, Mr. McDaniel, was at times they actually collected the soil included in the sample of the litter of soil that was remaining below the litter pack.

Q. Mr. Churchill, the Court heard testimony yesterday from Dr. Harwood that the uppermost layer of litter will have the highest concentration of viable bacteria. Does that illustrate

the problem you just described with the sampling of the litter?

A. I think it's an important point, sure.

Q. Now, the sampling of poultry litter, was it also to be composited from the house?

A. Yes.

Q. Briefly, what does that mean?

A. CDM typically collected, you know, individual aliquots. They walked through the poultry barns kind of in a zigzag pattern, typically collecting approximately 18 different aliquots that would be added to a bucket. Inside the bucket, there was a plastic bag. So they would add that to the bag and then the idea was to homogenize it, provide a split sample to CRA and then take their own samples from that. And what we witnessed was just a very, very poor job of homogenizing the sample partly just because of the, you know, the shape of the bucket. The bucket that might have been twelve to fourteen inches deep, you know, using a spade or a trowel to homogenize that material, they might have only mixed up the upper, you know, I would say not more than 50 percent of that material. And then providing, you know, a sample to CRA or a split sample to CRA, that's what we got. We wouldn't have gotten any of the material that was, you know, perhaps in the lower portion of the bucket and it probably would have been collected from the, you know, earlier sample aliquots. It was just a poor job of mixing.

01053

Q. What percentage of the poultry litter samples did you determine were compromised as a function of an improperly mixed composite?

A. Sixty-five percent.

Q. Did you ever observe, Mr. Churchill, where they took the sample of litter with a brand new shovel that still had the self-adhesive manufacturer's label on the surface of the shovel?

A. Yes, sir.

Q. How many times did you see that?

A. I can't give you the exact number offhand.

Q. Was it frequently?

A. I'll say it was periodically.

Q. So even the label on the face of the shovel had not been removed prior to sampling?

A. Yes.

Q. Now, your findings with regard to the high percentage of samples that were compromised overall, Mr. Churchill, is this normal for sampling of this kind?

A. Absolutely not.

Q. Now, the Plaintiffs' field team from CDM, do you believe they were aware of your presence and knew that you were documenting every move they made?

A. Well, they had to have been aware of our presence. We had three or four people standing in close proximity to their

01055

believe the samples are not representative of groundwater in the formation. With respect to the litter samples, I believe that the samples themselves do not have integrity and that as a result, the data would be considered unreliable.

Q. Did you draw any conclusions, Mr. Churchill, with regard to the level of training the CDM field personnel had received?

A. Quite frankly, they appeared to be rookies.

Q. Did you draw any opinions with regard to the level of care exhibited by the CDM sampling team?

A. Yes, it was clear to us that a very low level of care was taken.

Q. Did you develop any opinions about the CDM field team's level of regard for ensuring that samples taken were representative?

A. Yes, we did. I believe that most of the samples were compromised in some fashion and not representative of what was there.

MR. MCDANIEL: I will pass the witness, Your Honor.

THE COURT: How much time did we use there, Mr. Overton?

THE CLERK: 1:20 to 2:00. It looks like 40 minutes.

THE COURT: Forty. Mr. Page, cross-examination.

MR. PAGE: Thank you, Your Honor. David Page for the State of Oklahoma.

THE CLERK: Fifty. I misspoke.